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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/779,683	02/08/2001	A. John Appleby	TAMK:224 12740.0224.NPUS	4809

7590

08/26/2003

Janelle Waack  
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EXAMINER
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WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 08/26/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/779,683

Applicant(s)

APPLEBY ET AL.

Examiner

Wills M Monique

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 6/6/3.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION*****Response to Amendment***

The rejection of claims 12-13 & 26-27 under 35 U.S.C. 112, second paragraph, is overcome. The rejection of claims 1-28 under 35 U.S.C. 103(a) as being unpatentable over Fronk et al. U.S. Patent 6,372,376 and further in view of Dufner et al. U.S. Patent 6,024,848 is maintained. Newly added claims 29-30 are also rejected under 35 U.S.C. 103(a) as being unpatentable over Fronk et al. U.S. Patent 6,372,376 and further in view of Dufner et al. U.S. Patent 6,024,848. Additionally, claims 1-28

***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1,2, 5-9, 12-15 are provisionally rejected under the judicially created doctrine of double patenting over claims 1-13 of copending Application No. 09/779,872.

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This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows: a fuel cell component comprising a porous metal flow field, intermediate layer, electrode, three-dimensional reticulated sheet, protecting layer, thickness of protecting layer, method of making the fuel cell and at least two common materials for each of the aforementioned fuel cell constituents. More specifically, claim 1 of the instant application is shown in claim 1 of 09/779,872 where the porous flow field plate, intermediate layer and electrode are bonded together. Claim 2 of the instant application is shown in claim 1 & 5 of 09/779,872, wherein said porous metal flow field plate of claim 1 of the instant application comprises a three dimensional reticulated metal structure. Claim 5 of the instant application is shown in claims 1, 2 & 6 of 09/779,872, wherein said fuel cell component of claim 1 of the instant application includes a protecting layer disposed on at least one surface. Claim 6 of the instant application is shown in claims 1, 2, 6 & 7 of 09/779,872, wherein said fuel cell component of claim 1 of the instant application includes a protecting layer comprising a metal or a metal oxide. Claims 7, 8 & 9 of the instant application is shown in claims 1, 2, 6, 7 & 8 of 09/779,872, wherein said fuel cell component of claim 1 of the instant application includes a protecting layer comprising tin or tin oxide. Claim 12 of the instant application is shown in claims 1 & 9 of 09/779,872,

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wherein said fuel cell component of claim 1 of the instant application includes an intermediate layer comprising a polymer and high surface area carbon particles. Claim 13 of the instant application is shown in claims 1, 9 & 10 of 09/779,872, wherein said fuel cell component of claim 1 of the instant application includes an intermediate layer comprising a polymer selected from polytetrafluoroethylene, perfluoroethylene-perfluoropropylene copolymer, perfluoroalkoxy, or polyvanilidene fluoride. Claim 14 of the instant application is shown in claims 1 & 11 of 09/779,872, wherein said fuel cell component of claim 1 of the instant application includes an electrode comprising a polymer electrolyte and electrocatalyst.

Claim 15 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 13 of U.S. Application No. 09/779,872. Although the conflicting claims are not identical, they are not patentably distinct from each other because both include identical fuel cell components whereas in claim 15 of the instant application the claim is drawn to a method of making the fuel cell component by bonding all of the constituents and claim 13 of the co-pending application describes the same fuel cell constituents as being bonded directly to each other. Therefore, it is obvious that "layers bonded directly" to each other have been made by the method of "directly bonding" each layer to each other.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fronk et al. U.S. Patent 6,372,376 and further in view of Dufner et al. U.S. Patent 6,024,848.

Fronk teaches an electrically conducting fuel cell component comprising a metal flow field 60 having a plurality of grooves 66 known as flow fields (col. 4, lines 1-5) and made of aluminum (col. 5, lines 10-15). The flow field is bonded to an intermediate layer 94 comprising a plurality of conductive particles dispersed through an acid-resistant polymer matrix (col.4, lines 50-65). The conductive particles may include carbon black (col. 2, lines 50-60). The polymer comprises fluoro-elastomers such as polyvinylidene fluoride (col.5, lines 1-7). The conductive polymers may be selected from graphite, carbon and nickel (col.4, lines 50-60). The flow field also comprises a protective layer comprising nickel and other metal oxides (col.7, lines 5-25). The intermediate layer 94 is bonded to the flow field, and an electrode is bonded to the

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intermediate layer (col.4, lines 5-20 and col. 6, lines 1-10). The electrode includes a polymer electrolyte and electrocatalyst (col. 1, lines 15-25).

Fronk does not expressly disclose that the flow field is porous. The reference is silent to a protective layer comprising tin oxide and said oxide having a thickness between 1-5 microns.

Dufner teaches the employment of porous plates to decrease weight of the cell to meet specific operating demands (col.2, lines 40-50). The reference also teaches that it is well known in the art to employ tin oxide (col.8, lines 45-50) with a thickness of 0.1 to 1.0 microns (col. 7, lines 45-65). The tin oxide minimizes excess accumulation of liquid water at the cathode thereby restricting access of the gaseous oxidant to the cathode (col. 2, lines 55-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the porous flow fields of Dufner in the cell of Fronk to decrease weight of the cell to meet specific operating demands.

Regarding the tin oxide, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ tin oxide coating on the flow field of Fronk, because Dufner teaches that it minimizes excess accumulation of liquid water at the cathode thereby restricting access of the gaseous oxidant to the cathode.

### ***Response to Arguments***

Applicant contends that the subject invention is patentably distinct from Fronk, because the reference utilizes serpentine flow fields obviating the need for porous metal flow fields. This argument is not persuasive. Although the invention employs porous plates to eliminate the need for machined grooves, grooves and pores are not mutually exclusive. A grooved plate may also include pores to reduce the weight of the plate as taught by Dufner. More specifically, Dufner teaches a grooved flow field plate with pores to aid in reducing the weight of the fuel cell stack. Thus, the skilled artisan would be motivated to employ pores in serpentine plates to reduce weight of the fuel cell.

As to the motivation for employing the pores, applicant contends that this motivation is not sufficient because the decrease in weight is "mostly" due to the fact that the porous metal flow fields are bonded directly to the flow field, enabling the construction of a self-supporting glued up stack, which is lighter than conventional stacks. This argument is not persuasive. The applicant agrees that the porosity decreases the weight of the stack, and irrespective of the major causes of weight loss, the stack remains to be beneficially lighter when porosity is employed.

Applicant also asserts that a similar argument pertaining to Dufner, asserting that the reference does not cure the deficiencies of Fronk, because the Dufner plate has pores and thus would not benefit from grooves. This argument is not persuasive for the reasons set forth above. Further, applicant contends that the Dufner plate is not porous metal, but rather carbon-carbon composite of graphite powder phenolic resins. This is correct, but the argument is not persuasive. Fronk teaches a metal flow field plate, but does not expressly disclose the porosity of said plate, Dufner was relied upon merely to



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illustrate the conventionality of employing pores in flow filed plates. Lastly, applicant argues that the Dufner plate is distinct from the flow field plates of the present invention because the plates of Dufner are water transport plates, which are fundamentally different from the instant flow fields wherein gaseous reactants flow through the porous metal to the MEA. This argument is not persuasive. The claims are not commensurate in scope with the argument. In other words, the claim language does not necessitate the transportation of gaseous reactants to the MEA. Further, this consideration would not provide patentable distinctness because the plate of Dufner is capable of performing the same function.

### ***Conclusions***

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (703) 305-0073. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.


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If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 703-308-4333.

The unofficial fax number is (703) 305-3599. The Official fax number for non-final amendments is 703-872-9310. The Official fax number for after final amendments is 703-872-9311.

Mw

08/11/03

  
BRUCE F. BELL  
PRIMARY EXAMINER  
GROUP 1746